University of Central Punjab

Faculty of Information Technology

Data Structures and Algorithms
Spring 2022

Lab 10	
Topic	• Doubly LinkedList • Circular Doubly Linked List • Recursion
Objective	• The basic purpose of this lab is to implement ADT of Linked List and test its applications.

Instructions:

- Indent your code.
- Comment your code.
- Use meaningful variable names.
- Plan your code carefully on a piece of paper before you implement it.
- Name of the program should be same as the task name. i.e. the first program should be Task_1.cpp
- **void main() is not allowed. Use int main()**
- **You have to work in multiple files. i.e separate .h and .cpp files**
- **You are not allowed to use system("pause")**
- **You are not allowed to use any built-in functions**
- **You are required to follow the naming conventions as follow:**
    - **Variables:** firstName; (no underscores allowed)
    - **Function:** getName(); (no underscores allowed)
    - **ClassName:** BankAccount (no underscores allowed)

Students are required to complete the following tasks in lab timings.

Task 1

Write a Recursive Function named **“sum_of_list”** and add it in already created C++ Doubly Linked List class. Which calculates and return the sum of all the values entered by user in the linked list.

Task 2

Write a Recursive Function named **“product_of_Prime”** and add it in already created C++ Doubly Linked List class. Which calculates the product of all the prime number present in the linked list.

Task 3

Write a Recursive Function named **“display_Even_numbers”** and add it in already created C++ Doubly Linked List class. Which displays all the even numbers from the linked list

Task 4

Write a Recursive Function by the name of **“occurance_of_key”** and add it in already created C++ Doubly Linked List class. The main functionality of the function is that it finds all the occurrences of number entered by user.

Task 5

Write a Recursive Function by the name **“reverse_linkedList”** and add it in already created C++ Doubly Linked List class. Which reverses the original linked list. Print the linked list to verify.

Task 6

Write a Recursive Function by the name **“Palindrome_Check”** and add it in already created C++ Doubly Linked List class. Which traverse the linked list to check whether the data present in the nodes of linked list forms a palindrome or not.